FACT SHEET FOR STATE WASTE DISCHARGE PERMIT NO. ST-9000

TOWN OF WATERVILLE PUBLICLY-OWNED TREATMENT WORKS

SUMMARY

The Town of Waterville is primarily a farming community located approximately 26 miles northeast of Wenatchee in the west central portion of Douglas County. Sewage collection, treatment, and disposal are provided through a conventional gravity sanitary sewer collection system, one facultative treatment lagoon, one effluent storage lagoon, and an effluent irrigated sprayfield system.

In previous years, flows to the treatment plant have exceeded plant capacity on a number of occasions. The Town self-imposed a moratorium on sewer connections in July 1996. This situation prompted development of the *Town of Waterville Comprehensive Sewer System and Wastewater Treatment Facility Plan.* In the *Facility Plan*, which was approved by the Department of Ecology in 1998, demands on the existing and future wastewater facilities were assessed and predicted, design criteria were developed, and specific improvements to accommodate growth for the twenty year planning period were proposed. Minor repairs to the collection system led to a 15 to 20 percent reduction in flow. This enabled the Town to rescind the 1996 sewer moratorium in 2001 and forgo difficult to fund major improvements.

This permit will require the Town to follow a Schedule of Compliance for development of a Draft and Final Amended Engineering Report primarily to address apparent groundwater contamination from unlined lagoons. Additionally, under the Schedule of Compliance, the Town will be required to submit annual progress reports detailing facility improvement selection and activities leading to funding any approved upgrade.

The Town has complied with all Department of Health requirements listed in "Design Criteria for Municipal Wastewater Land Treatment Systems for Public Health Protection, February 1994" for sprayfield application of wastewater without disinfection. The Department has subsequently granted a disinfection waiver for the application of wastewater to the Town of Waterville.

The Town will be required to develop a Sampling and Analysis Plan for incorporation into its O & M Manual. Incorporating the Departmental approved plan in Appendix C of the O & M will allow the enforceable monitoring requirements of the permit to adapt to changing circumstances and engineering needs during the course of the proposed permit cycle without necessitating State expense of permit modification or reissuance during the next five years.

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INTRODUCTION

This fact sheet is a companion document to State Waste Discharge Permit No. ST-9000. The Department of Ecology (Department) is proposing to issue this permit, which will allow discharge of wastewater to waters of the State of Washington (State). This fact sheet explains the nature of the proposed discharge, the Department's decisions on limiting the pollutants in the wastewater, and the regulatory and technical bases for those decisions.

Washington State law (Revised Code of Washington (RCW) 90.48.080 and 90.48.162) requires that a permit be issued before discharge of wastewater to waters of the state is allowed. Regulations adopted by the State include procedures for issuing permits (Chapter 173-216 Washington Administrative Code (WAC)), technical criteria for discharges from municipal wastewater treatment facilities (Chapter 173-221 WAC) and water quality criteria for ground waters (Chapter 173-200 WAC). They also establish the basis for effluent limitations and other requirements which are to be included in the permit.

This fact sheet and draft permit are available for review by interested persons as described in Appendix A--Public Involvement Information.

This fact sheet and draft permit have been reviewed by the Washington State Department of Health and by the Permittee. Errors and omissions identified in these reviews have been corrected before going to public notice. After the public comment period has closed, the Department will summarize the substantive comments and the response to each comment. The summary and response to comments will become part of the file on the permit and parties submitting comments will receive a copy of the Department's response. This fact sheet will not be revised. Changes to the fact sheet and permit will be addressed in Appendix C--Response to Comments.

GENERAL INFORMATION	
Applicant	Town of Waterville
Facility Name and Address	Town of Waterville Public-Owned Treatment Works 104 E. Locust Street Waterville, WA 98858
Type of Treatment System:	Facultative lagoon and sprayfield
Discharge Location	Latitude: 47° 03' 30" N Longitude: 120° 37' 50" W.
Legal Description of Application Area	SW¼ Section 26, SE¼ Section 27, and the NW¼ of Section 35, Township 19N, Range 29 E.W.M.
Contact at Facility	Name: Martin Ramin Telephone #: 509-745-8871
Responsible Official	Name: Royal J. DeVaney Title: Mayor Address: PO Box 580 Waterville, WA 98858

BACKGROUND INFORMATION

The Town of Waterville is contained within an area of approximately one square mile. It has an estimated 2000 population of 1,163. Approximately 60 percent of the land area and 95 percent of the population has sewer service. The existing sewer system includes nearly ten miles of mainline pipe, 174 manholes, one lift station, a treatment facility, and an effluent treatment system. The system serves residential and light commercial customers.

DESCRIPTION OF THE COLLECTION AND TREATMENT SYSTEM

History

The majority of the collection system east of Chelan Avenue was constructed in the early 1940's and the sewers west of Chelan Avenue were constructed in 1955. Original construction materials were vitrified clay and concrete pipes with cement joints. Minor additions to the system since then have been made with various materials, including asbestos cement pipe. During 1954 and 1955, the Jefferson Street sewage lift station and the ten acre sewage treatment

lagoon were constructed. The single-cell stabilization lagoon was designed for a flow rate of 150,000 gpd and was expected to serve a population of 1,000. Although the lagoon was designed as a non-overflow lagoon, it was known to overflow for up to five months a year. Excessive flow from infiltration and inflow (I&I) was determined to be the primary cause of the lagoon overflows.

A wastewater facility plan was prepared in the late 1970's to address this problem and in the early 1980's several improvements were made to the facilities. System improvements included the replacement of nearly all of the interceptor sewers from the Town to the treatment lagoon with PVC pipe. A new storage lagoon and treatment system were constructed. These improvements were designed to remove excess flows and discharge of effluent to the adjacent creek, which channel was moved and lined Although some allowance for growth was made with the design of the storage lagoon, the improvements were not specifically designed for increased capacity, since Waterville was not expected to grow at that time. (1997 *Facility Plan*, Sec. 3, p. 1) According to the 2002 Census the population was 1163 and the estimated population for 2004 is unchanged at 1163.

Collection System Status

A limited assessment of those portions of the Town's collection system that could be easily accessed by an inspector, as opposed to a video camera, was conducted during the last permit period. Sewer pipe sizes and the construction material they are made of were determined by visual inspection from open manholes. However, some manholes on existing plans were not, or could not, be found. Some of the deficiencies found are briefly described in the following paragraphs.

Much of the sanitary sewer system within the core area of Waterville is approximately 50 years old. The October 2000 Sanitary Sewer Collection System Priority Sewer Plan Report reported collection system deficiencies with a proposed upgrade plan. However, the report does not conclude general or overall system obsolescence. Following video inspection, the report indicated the collection system was in fair condition.

Manholes vary in construction type, from all-brick to the newer precast concrete manholes. The majority of the manholes within City limits are constructed of brick or cinder brick. The structural integrity of these manholes is questionable and does not meet current code for safety. The Town has one submersible type sewage lift station which serves approximately 12 homes. The lift station was recently rebuilt with new pumps, electrical controls, and audio and visual alarm equipment. The lift station is not equipped with auxiliary power, but has several hours of storage time. Based on past experience, the Town has had the lift station off-line for a full day with no problem.

Wastewater flow is measured and recorded on a continuous basis at the treatment plant. Influent flow records were reviewed for the period from 1990 to 1996 and it was found that average daily

flow changed very little over that period. It was determined by the Town that, although flows generally increase with an increase in population, recent water system improvements and meter installation have reduced average per capita water use. Average per capita wastewater flows have been reduced from 119 gpd in 1990 to 107 gpd in 1995. (*Facility Plan*, Sec. 3, pp. 1-6) Flow data examined from September 2000 to October 2003 continues to demonstrate a reduction in flow most likely resulting from an installation of a new flow meter, improvements to some manholes and a series of dry years during the last permit cycle.

Treatment Processes

The Town had extensive plans to upgrade the existing treatment plant as detailed in the 1997 *Facility Plan*. However, as of March 2000, project funding for only the initial phases of the project had been secured. As of March 2004 upgrades to the existing facility have not been undertaken. The proposed permit will require the Town of Waterville to submit an amended engineering report to specifically address lining of the lagoons, collection system improvements and future capacity as needed.

Existing Treatment Facilities

The treatment plant is located approximately one mile south of town. The existing plant includes an influent flow meter, a treatment lagoon, a storage lagoon, transfer structures, and an effluent pump station. Effluent is applied to two nearby irrigation sprayfields.

A Parshall flume measures influent flows. Flow quantities are totalized continuously and the rate of flow recorded with a motorized tape system. The meter recording system is outdated, but provides adequate data for plant operations.

The 10-acre, single-cell stabilization lagoon was constructed in 1954 to serve 1,000 persons and treat 150,000 gpd. The lagoon was originally designed as a 4.5-foot deep, non-overflow lagoon, but was unable to contain excessive flows and, consequently, discharged to nearby Corbaley Creek during the spring months. The wastewater facilities were rehabilitated in 1980 to reduce I/I into the system and to eliminate the discharge to the creek.

The lagoon has an earthen berm on the bottom, which separates the inlet portion of the lagoon up to the 24-inch to 30-inch level in the pond. This sludge containment berm confines the solids that enter the lagoon to a 2.5 acre area. When untreated wastewater enters the lagoon, the settleable solids settle out near the inlet and undergo anaerobic decomposition. After this preliminary treatment, wastewater undergoes secondary treatment, a biological reaction in which organic dissolved and suspended matter is oxidized (converted) by bacteria into stable end products reducing BOD and suspended solids levels. Current State guidelines recommend that design loadings for stabilization lagoons not exceed 20 pounds of BOD per acre per day. The previously calculated loading rate was nearly 21 pounds per acre per day. Recent data shows

loading at approximately 13 lbs BOD/Acre/Day. The amended engineering report required during the proposed permit period will address the issue of lagoon capacity.

A second lagoon was constructed in 1980 to supplement the storage capacity of the treatment plant. This 6.5-acre lagoon was designed to store 12.7 million gallons of water during the late autumn, winter, and early spring months for disposal by land application during irrigation season.

The 1997 *Facility Plan* stated that water levels in both ponds had exceeded the average design elevations for the previous five years, and that they were at or near the wet year design levels three of five years. The conclusion at that time was that the treatment plant was operating at or above its intended design capacity. Recent flow data however, indicates influent flow is on average approximately 75% of capacity. The amended engineering report required during the proposed permit period will reevaluate the facility's current capacity and projected loading capacity.

The irrigation pump station lifts effluent from the storage lagoon to the sprayfield. The pump station utilizes a 75 horsepower pump, operating at a flow rate of 350 gallons per minute, to pump wastewater through a 6-inch diameter force main to a header line for the wheel line irrigation system. The force main is equipped with a flow meter to measure the amount of water applied to the sprayfield. The pump station equipment and piping is not housed and must be drained when freezing conditions are expected in order to prevent damage.

Waterville has been irrigating on portions of approximately 50 acres. There are 20 risers for connecting the wheel lines spaced at 60-foot intervals along the edge of the sprayfield. The wheel lines each irrigate a 60-foot strip at each set so that the entire field may be eventually covered with overlaps.

Electrical power to the treatment facility is provided through a 480/277 volt, 3-phase, 4-wire underground cable that is owned and operated by Douglas County Public Utility District No. 1. No backup power source is available in the area. Although the irrigation pump and the lagoon site flow distribution facilities are normally operated manually, a low level float switch was provided to shut off the pump if the storage lagoon level drops below the minimum pump operating level. (*Facility Plan,* Sec. 3, pp. 10-15)

Previously Proposed Treatment Plant Upgrade

Section 5 of the 1997 *Facility Plan* assessed three treatment plant upgrade alternatives. Alternative Three, Complete Mix Aerated Lagoons, was the option selected. However, at the time the previous permit was written, only the initial phases of the project had begun. Initial phases that have been completed include development and approval of the *Facility Plan,* installation of ground water monitoring wells, and preliminary evaluations of the irrigation pump station and sprayfield. In addition, a contract was signed to video inspect and clean 34,500 feet

of the collection system piping (Memo from Varela & Associates, Inc. to the Town of Waterville, dated December 15, 1999). As a result of the inspection some repairs were conducted on the collection system, which was found to be in fair condition. The repairs were financed through a Department of Ecology Priority Replacement Grant.

The Town has voiced dissatisfaction with the 1997 Facility Plan. The financial burden to the Town is considerable. It is uncertain if the upgrade as described in the 1997 Plan will ever be implemented. The proposed permit is requiring the Town to conduct an amended engineering report to assess conditions and pursue appropriate upgrades. The Town will then have to decide on a final plan and begin to seek funding for implementation. Portions of the 1997 Plan, described below that will be adopted into the any future upgrade decision are at this time unknown.

Residual Solids

Rags, scum, grit and other debris are removed via a bar screen and fine screen. Grit, rags, scum and screenings are drained and disposed of as solid waste at the local landfill.

The 1997 *Facility Plan* states that it is unlikely that sludge has ever been removed from the treatment lagoon since it was built in 1954. The sludge does not appear to be limiting treatment and it is stored below the minimum operating depth of the lagoon. A rough estimate of sludge volume was made during preparation of the plan by probing the sludge depth in various locations within the lagoon. There is approximately 1.6 million gallons of sludge confined within the 2.5 acre bermed area. The plan concludes that the expense of removing the sludge [prior to upgrade of the treatment lagoon] is not warranted and there may be little or no benefit to the system if the sludge is removed (Sec. 4, pp. 16-17). Sludge build up has not caused any problems to date.

GEOLOGY

Douglas County is part of the extensive Columbia Plateau, a massive basalt flow that later geologic action has warped, forming the Columbia Basin. Several sub-basins, including the Waterville Plateau, were formed by steep local folding and faulting. During the later glacial epoch, deposits of clay, silt, sand and gravel accumulated in these sub-basins.

The thick lava sequence consists of an undetermined number of flows, which are separated by sedimentary interbeds in places. Nearly everywhere, the basalt is overlain by surface sediments of varying thickness. In general, the basalt is buried more deeply beneath the coulees than beneath the uplands, where it is less than thirty feet below the surface. The basalt bedrock's interflow zones and coarse-grained sedimentary deposits in the sub-basins constitute important sources of ground water. Deposits of basaltic sand and gravel, deposited in part by glacial runoff, are widely distributed throughout the county, occurring as extensive sheets, terrace deposits, and channel fillings (*Facility Plan*, Sec. 3, pp. 17-18).

SOILS

The majority of soils in the area surrounding the wastewater treatment plant and sprayfield are the Farmer fine sandy loam, Hanning silt loam, Braodax silt loam, Van Nostern-Camaspatch complex, Jordy fine sandy loam, and Slusser fine sandy loam. The sprayfield is most affected by soil type and contains primarily the Farmer series. The soil is well drained, nearly level to gently sloping, and formed in loess mixed with volcanic ash in the surface on uplands. This soil has a fine sandy loam surface and a fine sandy loam and silt loam subsoil (Sec. 3, p. 18).

An analysis of sprayfield soils conducted for the *Facility Plan* revealed a wilting capacity of 0.12 inches/inch, a field capacity of 0.29 inches/inch, an available water capacity of 2.03 inches/foot and a saturated hydraulic conductivity of 0.47 inches/hour (Sec.4, p.20).

The soils in the sprayfield were evaluated to determine the impact annual wastewater irrigation has had on them. Three test pits were dug and samples were collected from various depths. Test Pit #1 was dug in a control (non-irrigated) area, Test Pit #2 was dug in soils where wastewater irrigation had taken place, and Test Pit #3 was dug in another irrigation area at a lower elevation than Test Pit #2. Results of the soils analysis are presented in the table below. Empty spaces in the table are as they appear in the original table presented in the *Facility Plan* (Sec. 4, pp.18-19).

Table 1: Results of Sprayfield Soil Analysis

Analysis	Test Pit 1 (Non-Irrigated) Control			Test Pit 2 High Point				Test Pit 3 Low Point		
	0-4"	3-5"	20"	3-5"	20"	29"	36"	3-5"	20"	35"
Total % solids	91.7	93.8	93.7	81.1	83.4	81	72	80.7	78	78.7
Salinity (Conductance mmho/cm)	0.2	0.17	0.23	0.9	1			0.64	1.1	
Cation Exchange Capacity (meq/100g)	14	13.5	15.6	13.5	17.8			15.2	14.1	
Sodium Exchangeable (meq/100g)	0.08	0.1	0.12	1.16	2.12			1.05	1.17	
pH	6.2	6.3	6.6	7.4	7.5			8.1	7.6	
Nitrate-Nitrogen (ppm)	1.9	0.9	1.4	1	1.1	1.5	1.4	5.3	1.3	1.3
Organic Matter (%)	2.2	1.8	0.8	1.4	0.8			2.5	0.8	
Texture by Hydrometer										
% Sand	25.1	27.6	21.3	22.6	11.3			44.1	35.3	
% Silt	61	58.5	72.3	58.5	68.6			46.3	55.1	
% Clay	13.9	13.9	6.37	18.9	20.1			9.58	9.58	

Uniform depth sampling among the three locations has not been conducted making any determination of impact difficult. The differences in the percent of clay, silt, and sand at the 3"to 5" and 20"core interval at the three locations further complicates the problem.

In general, the control pit has 10% higher solids than either the high and low pits. Salinity and sodium exchangeability is somewhat elevated in the sprayfield with little difference between the high and low location. Nitrate is slightly elevated at the low pit 3" to 5" interval but at the 20" interval nitrate concentration is uniform.

Table 2: Soil Data from 2001 and 2002 with Selected 1997 Data Attached

High Point of Field	Date Sampled	Total Nitrogen	CEC	Na Ex	K ppm	Ca ppm	Mg ppm	Na ppm	pH	NO3-N ppm	Sum of EX Bases	Sol Salts mmho/cm
1 foot	4/3/01	954	16.4	0.50	349	1480	386	116		0.4	12	0.16
	4/17/02	886	14.9		366	1270	383	103	7	1		
3 foot	4/3/01	712	17	1.36	125	1690	475	312	7.6	0.4	14	0.38
	4/17/02	772	16.4		165	1510	418	314	7.6	0.8		
5 foot	4/17/02	864	16.9	0.84	266	1970	595	194	7.9	0.4	16.2	0.75
Low Point of Field	Date Sampled	Total Nitrogen	CEC	Na Ex	K ppm	Ca ppm	Mg ppm	Na ppm	pH	NO_3-N ppm	Sum of EX Bases	Sol Salts mmho/cm
1 foot	4/3/01	838	15.6	1.01	286	1380	478	232	7.7	6.5	12.6	0.48
	4/17/02	925	16		352	1240	466	225	7.8	2.9		
3 foot	4/3/01	1000	67.2	3.87	611	9320	2300	890	7.7	5.1	70.9	0.62
	4/17/02	893	31		563	3960	1430	492	7.3	2.7		
5 foot	4/3/01	823	71.2	3.28	426	11700	2400	754	7.2	3.2	82.5	0.52

1997 ER Analysis	Cation Exchange Capacity (CEC)		Sodium Exchange			Nitrate Nitrogen			Sol Salts mmho/cm	
	Depth		Depth			Depth			Depth	
Location	3-5"	20"	0	3-5"	20"	3-5 "	20 "	36"	3-5"	20"
Non-Irrigated Field	13.5	15.6	0.08	0.1	0.12	0.9	1.4		0.17	0.23
High Point	13.5	17.8	-	1.16	2.12	1	1.1	1.4	0.9	1.0
Low Point	15.2	14.1	-	1.05	1.17	5.3	1.3	1.3	0.64	1.1

Monitoring has been inconsistent. There are insufficient data to draw conclusions other than generalities. CEC at the 1 foot and 20 inch interval has remained uniformly low during the 1997 to 2002 timeframe. At the 3 foot and 5 foot intervals the low point has a CEC three times that of the high point. This trend holds for the plant nutrients as well. Nitrate levels are higher at the low point throughout the core and might be increasing below the vadose zone. The sodium exchange rate is behaving in a comparable fashion. Soluble salts at the 3 foot level and above are higher at the low point. All locations, including the control, show increased soluble salts with depth.

Ferrous iron testing has consistently been negative at all soil monitoring sites. A positive test indicates anaerobic conditions caused by excessive hydrologic loadings, which can lead to groundwater quality degradation. The present hydrologic load is well below capacity as indicated by a negative ferrous iron test. Therefore, ferrous iron testing at the sprayfield will not be a requirement in the proposed permit.

GROUNDWATER

The *Facility Plan* describes a limited investigation of ground water monitoring that was performed in order to determine the impact of lagoon leakage on ground water quality (pp.12-15). Water samples were collected in shallow monitoring wells on the banks of Corbaley Creek above the lagoons (MW #1), Corbaley Creek below the lagoons (MW #2). In addition, influent samples were collected from the headworks and from the treatment lagoon, near the intake to the sprayfield irrigation pump.

Since background water quality data were not available at the time the 1997 *Facility Plan* was prepared, sampling data were compared to the State drinking water standards. The site investigation revealed that conductivity, total dissolved solids, and manganese were above the drinking water standards. The analysis contained in the 1997 *Facility Plan* speculated that the elevated manganese levels were caused by the presence of cattails creating anaerobic conditions in the subsurface. Because the ground water is anaerobic, bacteria that require oxygen may be concentrated around the shallow monitoring wells, using this location as a source for oxygen. Thus, it is possible that manganese fixing bacteria are living around the monitoring wells causing the manganese concentrations to be higher at the wells than it is in the ground water away from the wells (p.15).

The chloride levels may be elevated due to salting of the roads in the Waterville area during the winter. The elevated manganese and chloride levels are most likely the causes of the elevated total dissolved solids and conductivity values as well.

Several of the water supply wells in the area were reported in the 1997 *Facility Plan* to have elevated nitrate concentrations, with one of the wells having a concentration above the State

Maximum Contaminant Limit (MCL) for nitrate, and close to the State MCL for carbon tetrachloride in drinking water (Sec. 3, p. 20). The exact location of these wells is unknown.

The 1997 *Facility Plan* concluded that since there are no baseline water quality data prior to construction of the lagoons, it is difficult to determine if the ponds have degraded the original ground water quality. In addition, it is unknown whether the monitoring wells used to collect this data accurately represent ground water conditions, since construction details are lacking and they may not be properly sealed at the surface. Water supply wells in the area are generally several hundred feet deep and have 20 to 50-foot surface seals. The ground water monitoring wells used in the 1997 *Facility Plan* were replaced, as of October 1999.

Recent Analytical Results

Recent analytical results collected, October 2000 through October 2003, from two groundwater monitoring wells located up gradient, MW 1, of the lagoons and down gradient, MW 2, of the lagoons have led to the following observations:

Chloride concentrations at both locations are below the groundwater quality criterion of 250 mg/L. MW 1 average is 32.8 mg/L and MW 2 average is 82.7 mg/L. There appears to be no clear trend in concentration over time. The chloride concentration level in the wells is relatively stable except for the most recent sampling where the concentration of chloride in the two wells is practically identical with MW 1 at 37.1 mg/ and MW 2 at 42.1 mg/L.

TDS at both well locations show a decreasing trend in TDS concentration. The down gradient location exhibits the stronger of the trends with a slope of -8.8 and a R^2 of 0.71. The four year TDS average at MW 1 is 381 mg/L and at MW 2 it is 681 mg/L. MW 2 TDS is well above the groundwater quality criterion of 500 mg/L and demonstrates a concentration level almost a factor of two above the up gradient MW 1 location.

Conductivity is clearly higher at the down gradient location. The average conductivity at MW 1 is measured at 534 mmho/Cm and at MW 2 conductivity is1015 mmho/Cm. Conductivity, like TDS, demonstrates an increase of a factor of two above background. There is a downward trend over time in the TDS level, albeit slight.

Total Kjeldahl Nitrogen background at MW 1 has remained relatively constant over the four year sampling period, while at MW 2 there appears to be a slight downward trend. Average background concentration is at 0.4 mg/L total nitrogen. At MW 2 total nitrogen is three times the background at 1.3 mg/L.

Ammonia at MW 1 and MW 2 tracks very similar to the above total nitrogen. Background averaged over time is relatively constant at 0.1 mg/L. MW 2 exhibits a downward trend approaching background with an averaged value of 0.4 mg/L four times MW 1 value.

Nitrate tracks differently than ammonia and total nitrogen. Background concentrations appear to be lowering, while MW 2 appears to be increasing over time. Background averaged over time is almost four times that of the down gradient, MW 2, at 2.6mg/L to 0.7 mg/L respectively. The ferrous iron test indicates that in the last year or so soil conditions have gone from anaerobic to aerobic, which could account for the increase in nitrate. Nitrate levels at both locations remain well below the ground water quality criterion of 10 mg/L. Ferrous iron testing will be required at the MW 1 and MW 2 locations.

SURFACE WATER

Surface water is sampled at four locations along Corbaley Creek. SW1 is upstream of the treatment lagoons, SW2 is adjacent to the lagoons and SW3 and SW4 are spaced some distance downstream of the lagoons. Surface water is monitored to determine if wastewater from the unlined lagoons is reaching the lined Corbaley Creek.

Corbaley Creek was lined to inhibit exfiltration to the lagoon system and also to prevent infiltration from the lagoons in the early eighties. This was done during construction of the second lagoon, which necessitated moving the channel of the creek to its present location. The type of liner, other than it was black plastic, is unknown, however surface water monitoring shows no impact to the surface water, indicating either the liner is intact or infiltration has not been a problem.

There is no statistically significant difference between upstream and downstream locations based on the average TKN concentrations and overlap of the 95% error bars. As can be expected with flowing surface water and no point source of pollution, the data is highly scattered. Linear regressions with R^2s approaching zero drawn through the data demonstrates the lack of any clear trend over time. The four surface water locations are virtually indistinguishable from each other. For this reason, long term averages were analyzed in an attempt to identify any impact to the surface water quality arising from contaminated groundwater.

There is no statistically significant difference between upstream and downstream locations based on the average TDS concentrations and overlap of the 95% error bars.

There is no statistically significant difference between upstream and downstream locations based on the average conductivity and overlap of the 95% error bars. Therefore, it appears at this time, that the lagoons are not negatively impacting Corbaley Creek water quality.

There is no statistically significant difference between upstream and downstream locations based on the average chloride concentrations and overlap of the 95% error bars.

PERMIT STATUS

The previous permit for this facility was issued on July 28, 2000.

An application for permit renewal was received by the Department on December 9, 2003 and accepted by the Department on December 9, 2003.

SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT

A compliance inspection without sampling was conducted on July 22, 2003. The facility appeared to be in good operating order with a new influent meter working as expected.

Soil monitoring has not been in compliance with the monitoring requirements of the previous permit. The Department believes the development of a Sampling and Analysis Plan by the Permittee will foster better over all monitoring compliance on the part of the Permittee.

FACILITY LOADING

The design criteria for the existing treatment facility are taken from the previous permit and the permit application, and are as follows:

Monthly average flow:	0.15 MGD
Instantaneous peak flow:	0.72 MGD
BOD influent loading:	209 lbs/day

The Town has exceeded the design population, however, due to minor improvements flows are now within design criteria. During the past permit period the Town Council imposed a voluntary sewer hookup moratorium because of treatment plant overloading. The moratorium went into effect prior to collection system improvements, which apparently have eliminated flow capacity problems in the near term. In a letter to the Department received February 22, 2001, the Town indicated the moratorium had been rescinded. It further stated that applications for new sewer hook ups were to be carefully monitored and that applicants will be informed that winter storage problems may necessitate denial of their application.

TSS, in the best professional judgment of the permit writer, is not a critical design factor for a facultative lagoon system. Therefore, TSS has been removed from the above design criteria table.

WASTEWATER CHARACTERIZATION

Influent

Influent data presented in the table below are summarized from DMRs submitted to the Department from October 2001 to October 2003.

Parameter	Units	Average [a]	% Design Criteria	Min [b]	Max [c]	% Design Criteria
Flow	MGD	0.079	57.7	0.06	0.094	62.7
BOD_5	Lbs/Day	134.5	64.4	99.2	155.6	74.4
Ph	S. U.	NC [d]	NC	7.3	8.8	NC

[a] - Average of monthly averages reported for this parameter.
[b] -Minimum single sample result for this parameter.
[c] -Maximum single sample result for this parameter.
[d]-NC-Not calculated because measurement of pH is done on a logarithmic scale.

The Town has experienced problems with flow in the past and had instituted a moratorium on new sewer hook ups which has since been removed. The Town is required to develop an amended engineering report to address lining the lagoons because of possible groundwater contamination. This will necessitate a through examination of inflow and flow capacity in preparation to lining the lagoons.

Effluent

The concentration of pollutants in the sprayfield discharge was reported in the permit application. The data presented in the table below are summarized from DMRs submitted to the Department from October 2001 to October 2003.

Parameter	Permit or Design Limits	Data Analyzed from October 2001-October 2003					
		Monthly Average [1]	% Limit	Minimum[2]	% Limit	Maximum[3]	% Limit
Flow (MGD)	0.150	0.123	82	0.073	48.7	0.148	98.7
BOD_5 (Sol) mg/L	60	10.8	18	5	8	24.5	40.8
Fecal Coliform	100 colonies per 100 mls.	657	657	2	2	3000	3000
pH	5-11 S.U.	NC	NC	7.9	NC	9.5	NC

[1]-Average of monthly averages reported for this parameter.
[2]-Minimum single sample result for this parameter.
[3]-Maximum single sample result for this parameter.
NC = Not calculated because measurement of pH is done on a logarithmic scale.

SEPA COMPLIANCE

A photocopy of the completed SEPA checklist for the previously proposed treatment works is contained in Appendix K of the *Facility Plan.* At this time any proposed upgrades are yet to be determined.

PROPOSED PERMIT LIMITATIONS

State regulations require that limitations set forth in a waste discharge permit must be either technology- or water quality-based. Wastewater must be treated using "all known, available, and reasonable methods of prevention, control and treatment" (AKART) and not pollute the waters of the State. The minimum requirements to demonstrate compliance with the AKART standard are derived from the *Design Criteria for Municipal Wastewater Land Treatment,* Chapter 173-221 WAC, and best professional judgment (BPJ).

This permit also includes limitations on the quantity and quality of the wastewater applied to the sprayfield that have been determined to protect the quality of the ground water. In the best professional judgment of the Department's Central Regional Office Water Quality Engineer and Hydrogeologist, the effluent limitations detailed below will be protective of ground water quality. The approved engineering report includes specific design criteria for this facility.

TECHNOLOGY-BASED EFFLUENT LIMITATIONS

All waste discharge permits issued by the Department must specify conditions requiring AKART of discharges to waters of the State (WAC 173-216-110). The following permit limitations are necessary to satisfy the requirement for AKART.

pH

pH shall be within the range of 5.0 to 11 standard units. Lagoon waters that are outside of these limitations shall be neutralized to within this range before application to the sprayfield. The buffering capacity of the sprayfield soils will allow application of wastewater within this range of pH with a sufficient margin of safety to protect ground water quality.

Soluble BOD (5-day)

Soluble BOD_5 shall be less than 60 mg/L before discharge to the sprayfields. This criterion was determined to be consistent with other land application permits issued, and because this level of organic loading has been shown to be conservative.

TSS

Although excessive TSS may inhibit infiltration of the wastewater into the soil, TSS is not limited in this permit, but a requirement for interrupting irrigation if run-off or ponding occurs is included in the approved sprayfield management plan.

Fecal Coliform Bacteria

The Department of Health has determined that the Permittee's land treatment system is in compliance with the Department of Health's "Design Criteria for Municipal Wastewater Land Treatment Systems for Public Health Protection, February 1994". Furthermore the facility meets pre-treatment requirements which exempt them from the need to disinfect the wastewater prior to land application by completing the following measures:

- Increased setbacks to 650 ft.
- Installed automatic shut off wind sensors.
- Installed fencing and signage to control unauthorized access.
- Possess long term control of the sprayfield land with a long term lease.
- Instituted irrigation and farm management practices that prevent ponding of and worker exposure to non-disinfected wastewater.

The Department, following consultation with the Department of Health and verification of mandatory mitigation measures completed by the Town, is allowing the Town to apply non-disinfected wastewater to its land treatment system.

GROUND WATER QUALITY-BASED EFFLUENT LIMITATIONS

In order to protect existing water quality and preserve the designated beneficial uses of Washington's ground waters including the protection of human health, WAC 173-200-100 states that waste discharge permits shall be conditioned in such a manner as to authorize only activities that will not cause violations of the Ground Water Quality Standards. The goal of the ground water quality standards is to maintain the highest quality of the State's ground waters and to protect existing and future beneficial uses of the ground water through the reduction or elimination of the discharge of contaminants to ground water [WAC 173-200-010(4)]. This goal is achieved by [GW Implementation Guidance, Abstract, page x]:

1. Requiring that AKART (all known available and reasonable methods of prevention, control and treatment) be applied to any discharge;

2. Application of the antidegradation policy of the ground water quality standards. This policy mandates protecting background water quality and preventing degradation of water quality which would harm a beneficial use or violate the ground water standards; and

3. Establishing numeric and narrative criteria for the protection of human health and welfare in the ground water quality standards.

Numeric ground water criteria (maximum contaminate concentrations) are based on drinking water quality criteria. Applicable criteria concentrations are listed below:

Ground Water Quality Criteria

Total Dissolved Solids	500 mg/L
Chloride	250 mg/L
Nitrate (as N)	10 mg/L

The intent of the ground water quality standards is to protect background water quality to the extent practical, rather than to allow degradation of ground water quality to the criteria. The procedures for estimating background water quality are contained in the Guidance Document for Implementing the Ground Water Standards (Ecology, 1996). Background water quality is defined as the 95 percent upper tolerance interval with a 95 percent confidence.

This permit will not contain ground water quality limitations, at this time. In the best professional judgment of the Department, characteristics of the wastewater and site soils indicate the sprayfield discharge is unlikely to impact ground water quality. However, the Department reserves the right to revise the permit at any time during the permit cycle in the event monitoring data indicates that ground water quality is being impacted by the sprayfield.

The Department is concerned that the lagoons are infiltrating to the groundwater and may have impacted the groundwater quality. The permit will require the Town to address this issue with an amended engineering report.

COMPARISON OF LIMITATIONS WITH THE PREVIOUS PERMIT

The effluent limitations with the exception of effluent pH, fecal coliform and chlorine in the proposed permit will remain unchanged from those contained in the previous permit.

MONITORING REQUIREMENTS

Monitoring, recording, and reporting are specified to verify that the treatment process is functioning correctly, that ground water criteria are not violated, and that effluent limitations are being achieved (WAC 173-216-110).

SAMPLING AND ANALYSIS PLAN

The draft *Facility Plan* initially proposed a monitoring program of wastewater, ground water, and sprayfield soils (Sec. 4, p. 21). The Town's consultants, on the Town's behalf, requested a revision of the monitoring program in a letter to the Department, dated January 26, 1998, which was approved with the *Facility Plan* in April 1998. It is this revised monitoring plan which appears in Special Condition S2. of the previous permit and which will constitute the interim monitoring requirements of the proposed permit. The Department anticipates monitoring requirements may change in response to the required amended engineering report and as facility improvements come on line. Therefore the Permittee will be required to develop a Sampling and Analysis Plan, SAP, Special Condition, S9, and submit the SAP for approval no later than **April 1, 2008**. Until such time as the approved SAP is incorporated into the O & M Manual, Appendix C, the interim monitoring requirements contained in Special Condition S2 of the proposed permit constitute the enforceable monitoring requirements with the exception of ferrous iron which will be required to be monitored monthly at the MW 1 and MW 2 groundwater monitoring wells. Upon approval the SAP will be incorporated into Appendix C of the O & M Manual. The SAP shall then constitute the enforceable monitoring requirements of the permit.

OTHER PERMIT CONDITIONS

REPORTING AND RECORDKEEPING

The requirements of Special Condition S3. are based on the authority to specify any appropriate reporting and recordkeeping requirements to prevent and control waste discharges (WAC 273-216-110).

SCHEDULE OF COMPLIANCE

Amended Engineering Report

To date Town has not implemented the 1997 Facility Plan recommendations. It is unknown at this time what portions of the 1997 Facility Plan the Town of Waterville intends to implement. Recent data appears to run counter to conclusions drawn in the 1997 Plan. Conditions have changed. Some minor repairs to the collection system have been completed. Lagoon BOD loading once estimated at 21 lbs/Acre is now calculated at approximately 13.5 lbs/ Acre. It is apparent the Town needs to reevaluate the present condition of the treatment system in light of recent data and develop a plan to implement any needed improvements. Under Special Condition, S8., Schedule of Compliance, the Town is required to reevaluate, via an Amended Engineering Report, the state of the facility’s ability to remain in compliance with water quality standards. The Town will also need to determine any improvements it needs to remain in compliance now and for a reasonable time into the future. A draft amended engineering report is

due at the Department for review by July 1, 2006. The final approved report is due by February 1, 2007.

Annual Progress Report

With potentially high anticipated costs of public works projects, and with the low Town population, the Town of Waterville will need to aggressively investigate opportunities for acquiring funds to pay for any proposed upgrades. It is expected that this process will take some time. For tracking purposes, the Permittee will be required to submit annual updates on the progress made toward funding those projects necessary to comply with state and federal water quality statute beginning no later than July 2007 .

OPERATIONS AND MAINTENANCE

This permit contains Special Condition S5. as authorized under RCW 90.48.110, WAC 173-220-150, Chapter 173-230 WAC, and WAC 173-240-080. It is included to ensure proper operation and regular maintenance of equipment, and to ensure that adequate safeguards are taken so that constructed facilities are used to their optimum potential in terms of pollutant capture and treatment. The last O&M Manual update was in 2002.

In the interest of providing the treatment plant operators with a formalized list of sprayfield best management practices, maximum allowable sprayfield loading limits, and procedures and protocols required to conduct the self-monitoring program, all in one document, the previous permit required the development and submittal of Appendices to the A, B, and C to the Department for review and approval. The approved appendices were then incorporated into the O & M Manual.

This permit requires the Permittee review its O&M Manual annually and report this to the Department by letter and submit any updates to the Manual and Appendices A, B, and C of the O&M Manual for Departmental approval prior to O & M Manual inclusion as needed. In particular, Appendix C contains the enforceable Monitoring Requirements, determined by the Sampling and Analysis Plan developed by the Permittee. The Monitoring Requirements may change during the course of the proposed permit period. As the Permittee develops the engineering report and facility improvements are implemented adaptive monitoring is appropriate. Inclusion of the SAP which constitutes the enforceable monitoring requirements into the O & M Manual will allow the monitoring requirements to be modified without State expense of permit reissuance or modification.

RESIDUAL SOLIDS HANDLING

To prevent water pollution the Permittee is required in permit Special Condition S6. to store and handle all residual solids (grit, screenings, scum, sludge, and other solid waste) in accordance with the requirements of RCW 90.48.080 and State Water Quality Standards.

The final use and disposal of sewage sludge from this facility is regulated by U.S. EPA under 40 CFR 503 and the State of Washington under Chapter 173-308 WAC, "Biosolids Management." The disposal of other solid waste is under the jurisdiction of the local health district.

Requirements for monitoring sewage sludge and recordkeeping are included in this permit.

GENERAL CONDITIONS

General Conditions are based directly on state laws and regulations and have been standardized for all industrial waste discharge to ground water permits issued by the Department.

Condition G1. requires responsible officials or their designated representatives to sign submittals to the Department. Condition G2. requires the Permittee to allow the Department to access the treatment system, production facility, and records related to the permit. Condition G3. specifies conditions for modifying, suspending or terminating the permit. Condition G4. requires the Permittee to apply to the Department prior to increasing or varying the discharge from the levels stated in the permit application. Condition G5. requires the Permittee to submit written notice of significant increases in the amount or nature of discharges (typically new industrial discharges) into the sewer system tributary to the permitted facility. Condition G6. requires the Permittee to construct, modify, and operate the permitted facility in accordance with approved engineering documents. Condition G7. prohibits the Permittee from using the permit as a basis for violating any laws, statutes or regulations. Condition G8. requires application for permit renewal sixty (60) days prior to the expiration of the permit. Condition G9. requires the payment of permit fees. Condition G10. describes the penalties for violating permit conditions.

RECOMMENDATION FOR PERMIT ISSUANCE

This proposed permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to control toxics, and to protect human health and the beneficial uses of waters of the State. The Department proposes that the permit be issued for five (5) years.

REFERENCES FOR TEXT AND APPENDICES

Faulkner, S.P., Patrick Jr., W.H., Gambrell, R.P., May-June, 1989. *Field Techniques for Measuring Wetland Soil Parameters*, Soil Science Society of America Journal, Vol. 53, No.3.

RH2 Columbia Engineering, Inc., 1997. *Town of Waterville Comprehensive Sewer System and Wastewater Treatment Facility Plan*.

RH2 Columbia Engineering, Inc., Letter dated January 26, 1998. Town of Waterville-Town of Waterville Comprehensive Sewer System and Wastewater Treatment Facility Plan Response to Final Review Comments.

Washington State Department of Ecology, 1993. *Guidelines for Preparation of Engineering Reports for Industrial Wastewater Land Application Systems,* Ecology Publication # 93-36. 20 pp.

Washington State Department of Ecology and Department of Health, 1993. *Water Reclamation and Reuse Interim Standards*, Ecology Publication # 93-21. 23 pp.

Washington State Department of Ecology, 1996. *Implementation Guidance for the Ground Water Quality Standards,* Ecology Publication # 96-02.

Washington State University, November, 1981. *Laboratory Procedures - Soil Testing Laboratory*. 38 pp.

APPENDIX A -- PUBLIC INVOLVEMENT INFORMATION

The Department has tentatively determined to reissue a permit to the applicant listed on page 1 of this fact sheet. The permit contains conditions and effluent limitations which are described in the rest of this fact sheet.

The Department published a Public Notice of Draft (PNOD) on May 20, 2004, in Douglas County Empire Press to inform the public that an application, draft permit and fact sheet were available for review. Interested persons are invited to submit written comments regarding the draft permit. The draft permit, fact sheet, and related documents are available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. weekdays, by appointment, at the regional office listed below. Written comments should be mailed to:

Water Quality Permit Coordinator
Department of Ecology
Central Regional Office
15 West Yakima Avenue, Suite 200
Yakima, WA 98902

Any interested party may comment on the draft permit or request a public hearing on this draft permit within the thirty (30) day comment period to the address above. The request for a hearing shall indicate the interest of the party and the reasons why the hearing is warranted. The Department will hold a hearing if it determines there is a significant public interest in the draft permit (WAC 173-220-090). Public notice regarding any hearing will be circulated at least thirty (30) days in advance of the hearing. People expressing an interest in this permit will be mailed an individual notice of hearing (WAC 173-220-100).

Comments should reference specific text followed by proposed modification or concern when possible. Comments may address technical issues, accuracy and completeness of information, the scope of the facility's proposed coverage, adequacy of environmental protection, permit conditions, or any other concern that would result from issuance of this permit.

The Department will consider all comments received within thirty (30) days from the date of public notice of draft indicated above, in formulating a final determination to issue, revise, or deny the permit. The Department's response to all significant comments is available upon request and will be mailed directly to people expressing an interest in this permit.

Further information may be obtained from the Department by telephone, 509/457-7105, or by writing to the address listed above.

This permit was written by Richard Marcley

APPENDIX B -- GLOSSARY

AKART--An acronym for "all known, available, and reasonable methods of prevention, control, and treatment" and includes best management practices as may be stipulated by the Department.

Ambient Water Quality--The existing environmental condition of the water in a receiving water body.

Ammonia--Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

Average Monthly Discharge Limitation--The highest allowable average of daily discharge values over a calendar month, calculated as the sum of all daily discharge values measured during a calendar month divided by the number of daily discharge values measured during that same calendar month.

Best Management Practices (BMPs)--Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the State. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

BOD_5--Determining the Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD_5 is used in modeling to measure the reduction of dissolved oxygen in a receiving water after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

Bypass--The intentional diversion of waste streams from any portion of the collection or treatment facility.

Chlorine--Chlorine is used to disinfect wastewaters of pathogens harmful to human health. It is also extremely toxic to aquatic life.

Compliance Inspection - Without Sampling--A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

Compliance Inspection - With Sampling--A site visit to accomplish the purpose of a Compliance Inspection - Without Sampling and as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the 85 percent removal requirement. Additional sampling may be conducted.

Composite Sample--A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing discrete samples. May be "time-composite"(collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots.

Construction Activity--Clearing, grading, excavation and any other activity which disturbs the surface of the land. Such activities may include road building, construction of residential houses, office buildings, or industrial buildings, and demolition activity.

Distribution Uniformity--The uniformity of infiltration (or application in the case of sprinkle or trickle irrigation) throughout the field expressed as a percent relating to the average depth infiltrated in the lowest one-quarter of the area to the average depth of water infiltrated.

Engineering Report--A document, signed by a professional licensed engineer, which thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report shall contain the appropriate information required in WAC 173-240-060 or 173-240-130.

Fecal Coliform Bacteria--Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated wastewater and/or the presence of animal feces.

Grab Sample--A single sample or measurement taken at a specific time or over as short period of time as is feasible.

Industrial Wastewater--Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business, from the development of any natural resource, or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities.

Maximum Daily Discharge Limitation--The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar

day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

Method Detection Level (MDL)--The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is above zero and is determined from analysis of a sample in a given matrix containing the analyte.

pH--The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

Quantitation Level (QL)-- A calculated value five times the MDL (method detection level).

Soil Scientist--An individual who is registered as a Certified or Registered Professional Soil Scientist or as a Certified Professional Soil Specialist by the American Registry of Certified Professionals in Agronomy, Crops, and Soils or by the National Society of Consulting Scientists or who has the credentials for membership. Minimum requirements for eligibility are: possession of a baccalaureate, masters, or doctorate degree from a U.S. or Canadian institution with a minimum of thirty (30) semester hours or forty-five (45) quarter hours professional core courses in agronomy, crops or soils, and have 5, 3, or 1 years, respectively, of professional experience working in the area of agronomy, crops, or soils.

State Waters--Lakes, rivers, ponds, streams, inland waters, wetlands, underground waters, salt waters, and all other surface waters and watercourses within the jurisdiction of the State of Washington.

Stormwater--That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a storm water drainage system into a defined surface water body, or a constructed infiltration facility.

Technology-based Effluent Limit--A permit limit that is based on the ability of a treatment method to reduce the pollutant.

Total Coliform Bacteria--A microbiological test which detects and enumerates the total coliform group of bacteria in water samples.

Total Dissolved Solids--That portion of total solids in water or wastewater that passes through a specific filter.

Total Suspended Solids (TSS)--Total suspended solids is the particulate material in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out

light and can promote and maintain the development of noxious conditions through oxygen depletion.

Water Quality-based Effluent Limit--A permit limit on the concentration and/or mass of an effluent parameter that is intended to prevent pollution of the receiving water.

APPENDIX C -- RESPONSE TO COMMENTS

No comments were received by the Department of Ecology.